This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Armakan Sandana

Other Options

Return to menu Plot this site on a topographic map View scanned well log (8/7/2009 2:33:23 PM)

Site Name: ANACONDA ALUMINUM #5

GWIC Id: 85180

Section 1: Well Owner(s)

1) ANACONDA ALUMINUM COMPANY (MAIL)

COLUMBIA FALLS MT 59912 [10/28/1954]

Damen

Section 2: Location

Tarrenostia.

(Ownsing	nange	ORCHON	V68860	mi archan	3
30N	20W	2	SW% SI	NW NEW SI	NY.
	County		G	ieocode	
FLATHEAD					
Latitude	Lor	ngitude	Geometh	od [)atum
48.389249	114.	126356	TRS-SE	C N	IAD83
Ground	Surface Al	titude	Method	Datum	Date
	3123				
Addition		Block	i	Lot	

Constan

Section 3: Proposed Use of Water

INDUSTRIAL (1)

PUBLIC WATER SUPPLY (2)

Section 4: Type of Work

Drilling Method: PICK & SHOVEL

Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, October 28, 1954

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Wall

Casing

2.10888	130	50 800 8	£385£653	3.686789	1882	3.4838	133	JOHN	cyps
0	137	'.9 16	************						STEEL
Comp	letic	n (Perfi	Scree	n)					
			# 0	ŧ	Size	of			
From	To	Diamei	er Op	enings	Oper	dngs	Desci	ription	
137.5	162	6				************	JOHN	STON	16IN SC

Pressure

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 171 Static Water Level: 106 Water Temperature:

Pump Test *

Depth pump set for test _ feet.

903 gpm pump rate with _ feet of drawdown after 84 hours of

pumping.

Time of recovery hours.

Recovery water level feet.

Pumping water level 115 feet.

* During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.

Section 8: Remarks

Section 9: Well Log Geologic Source

112OTSH - GLACIAL OUTWASH (PLEISTOCENE)

From	To	Description
0	30	ROCK AND GRAVEL
30	38	SAND & SMALL GRAVEL
38	48	SAND & SMALL GRAVEL
48	54	GRAVEL & SAND
54	56	CLAY & GRAVEL
56	60	COARSE SAND & SMALL GRVEL
60	64	GRAVEL & CLAY
64	70	LARGE ROCK GRAVEL AND SAND
70	80	MEDIUM ROCK GRAVEL & SAND
80	101	COARSE SAND AND SMALL ROCK
101	106	COARSE GRAVEL
106	112	GRAVEL & SAND
112	133	ROCK SAND & GRAVEL
133	136	ROCK GRVEL SAND & CLAY
136	139	GRAVEL & SAND

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:

Company: LAYNE-MINNESOTA

License No: -

Date Completed: 10/28/1954

Site Name GWIC ld: Additiona	35180	NDA ALUMINUM #5 / Records
From	To	Description
139	140	GRAVEL & CLAY
140	146	GRAVEL SAND ROCKS & CEMENTED GRAVEL
146	147	GRAVEL & CLAY
147	151	GRAVEL SAND & CEMENTED GRAVEL
151	152	GRAVEL & CLAY
152	159	SAND & SMALL GRAVEL
159	168	ROCK GRAVEL & SAND
168	171	SAND & GRAVEL

	029 30N 20W OZ CAD FLATMEAD	061362
		x
	MONTANA BUREAU OF MINES AND GEOLOGY Butte, Montana	PW4/85181
	WATER WELL LOG	
	Owner Assassas Alianasas San Address San A	
4-	Date Started JULY, 1956. Date Comp Location: Sec. 2 T. 32 M. B. 20 N % sec. NW.	
	Type of well DAC 26" COMOS 26" Equipment used 23% & (Court	Signatura Madd. molany, officer)
	Water use: Domestic	Irrigation 🔲 🕮
	Casing: 2222467 tt to 2282428 ft. Type 28603 Size	
	Casing: // Type	salata ang pilipangan palata ang pilipangan palata ang pilipangan palata ang pilipangan palata ang pilipangan
	Casing:ft toft TypeSize Perforated or Screened: Ft. #222,880 to ft. #228,492 Ft.	
	Type of screen or perforations 2010.0000 AS SSECO	****************
	Static Woter level, for non-flowing well: 3017,34 (Siver El., 3016,0)	
		(date)
	Pumping water level 3032,27 feet at 1595	per min
	Now tested: By Continuous Paspins	
	Length of test	
	Remarks: (Gravel packing, comenting, packers, type of shut-off, depth of shut-off)	man tem salan etinan eti soona eti soosa eti soo
		NAMES AND ASSESSED OF A STATE OF THE STATE O
	(aver)	M18688 .

Dept.	h, feri To	Description of Material Drilled
	2106.2	
22.04. * 3	3100.5	<u> </u>
3100 x 3	3997.5	014
2097. s. 5	3033.5	
3083.5	3079.5	Oley End Orayel
3079*5	3069.3	
: 2069.5	3067.5	Gravel and land
3067.2	304.5	
2064 (2	13051.2	Sock and Grevel
3051.5	3940.1	<u> </u>
1040 x 5	303.2.5	Fine Send, Clay, Oravel and Silt
2212.	3007.5	615y 4 Grayel
3007.5	3997.5	31lt, Clay a Oravel
29>7.65	2991.5	Coarse Sand, Cravel & Boulders
25915	2070.5	<u> Clay, Sand, & Gravel</u>
2970.5	2966.5	<u> 1/2" to 1." Seevol</u>
	2930.65	Fine & Coarge Sand > Silt
2000.0	2956.5	Tine Send à Silt.
		•

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filling of this report.

Other Options

Return to menu
Plot this site on a topographic map
View field visits for this site
View scanned well log (8/7/2009 2:33:40 PM)

Site Name: ANACONDA ALUMINUM #4

GWIC Id: 85181

Section 1: Well Owner(s)

1) ANACONDA ALUMINUM COMPANY (MAIL)

COLUMBIA FALLS MT 59912 [08/14/1954]

Section 2: Location

Township	Range	Section	Quarte	r Section:	8
30N	20W	2	NEX NW	% SE% SV	N%
	County		Ge	ocode	
FLATHEAD					
Latitude	Longi	tude	Geomethod	D	atum
48.3886	114.1	219	UNKNOWN	N	AD27
Ground	Surface Al	titude	Method	Datum	Date
	3130				
Addition		Blo	ck	Lot	

Section 3: Proposed Use of Water

INDUSTRIAL (1)

PUBLIC WATER SUPPLY (2)

Section 4: Type of Work

Drilling Method: PICK & SHOVEL

Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Salurday, August 14, 1954

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Wall

Casing

erom:	102	N. SHING	COS 1381	SKII COO	wan	:23	O.C.SEST	13/52
0	154.2	16		***************************************				STEEL
Comp	letion	(Perl/Sc	reen)			·		
			# of	Size	of			
From	To D	iameter	Openir	ıgs Oper	iings	Desc	ription	

Pressure

JOHNSTON 16IN SC

|154.2|176|16 Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 185 Static Water Level: 122 Water Temperature:

Pump Test*

Depth pump set for test __feet.

<u>1508</u> gpm pump rate with _ feet of drawdown after <u>168</u> hours of

pumping.

Time of recovery _ hours, Recovery water level _ feet. Pumping water level 127_feet.

and the state of t

* During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.

Section 8: Remarks

Section 9: Well Log Geologic Source

112ALVM - ALLUVIUM (PLEISTOCENE)

From	To	Description
0	35	COARSE ROCK & GRAVEL
35	39	SAND AND GRAVEL
39	42	CLAY AND GRAVEL
42	56	GRAVEL AND SAND
56	60	CLAY AND GRAVEL
60	70	CLAY AND ROCK
70	72	GRAVEL AND SAND
72	75	CLAY AND GRVEL
75	88	ROCK AND GRAVEL
88	99	GRAVEL & SAND
99	127	FINE SAND CLAY GRAVEL AND SILT
127	132	CLAY & GRAVEL
132	142	SLTCLAY& GRAVEL
142	148	COARSE SAND GRAVEL & BOULDERS
148	169	CLAY SAND & GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:

Company: LAYNE-MINNESOTA

License No: -

Date Completed: 8/14/1954

S	Site Name: ANACONDA ALUMINUM #4					
C	iWIC ld: I	85181				
ø	dditiona	l Lithology				
8	rom	To	Description			
0000	169	174	1/2IN TO 4IN GRVEL			
	174	183	FINE & COARSE SAND & SILT			
and the second	183	185	FINE SAND & SILT			

029 30N 20N 02 C 6 6 6 7	CATHEAD	061363
	T	
	County	
MONTANA BUREAU OF MINES A	ND GEOLOGY	PW3/85183
WATER WELL LOG	· \$ \$	
Owner Anatheria Aliminas Company Detter Layron Milmagaria Company Date Started March 11, 1234 Location: Sec. 2 T 30 H R 20 Type of well Diag 36 Gasasi 145 Equipment of the Casing: Domestic Municipal S Industrial E Drainage Other Casing: 2420.825 ft. to 2722.826 ft. Type Skand Casing: ft. to ft. Type Casing: ft. to ft. Type Perforated or Screened: Ft. 2222.826 to ft. 2222.826 ft Type of screen or perforations Simile Water level, for non-flowing well: 3216.36 Simil in pressure, for flowing well: 1216.36 Simil in pressure, for flowing well: 1216.36	Address E Date Comp M M sec. NS 5. 1 Sec. 12. 13. 13. 13. 13. 13. 13. 13. 13. 13. 13	cod Samuello, 1999 Indication D Address Contained to the contained to t
Now tested: By Continuous Europes. Length of test 210 Hrs		
Remarks: (Orayel packing, tementing, packers, type of shut-off, d		
armains, (opera poenis, commune, parame, type at sum tat, c	ongener wa serren "Will)	
Nole No. 1 10 Formances Nell /	Ž	

(over)

M185183

		10% VV VV3
- 0000000000000000000000000000000000000	n, feet	Description of Material Drilled
From	10	
in in the second		
3306.0	3066.0	
47. 7		
30%.40	1061.0	<u> </u>
24 1	4	
3000	3066.0	
	2.5	
3030.00	3037.0	800 S.C. J. S. 200 A. J. 200 A. S. 200 A. J. 2
63	584	
3037.0	3022.0	
	1 1	
302240	3020.0	
30000	1.2696.0	<u> </u>
	1 20 20 20 20 20 20	XV 8
2222		<u>Flao Grevel & Saod</u>
1000		Gostae Bodk & Sand
2993.0	2090.0	Comented Rock & Sand
- siddista disdigathadaaaa		
	2024.	Grovel Rock & Sand
	·	

1,555 1,5 11 5 1 1 1 1 1 1 1 1 1 1 1 1 1		

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filling of this report.

Other Options

Return to menu Plot this site on a topographic map View field visits for this site View scanned well log (8/7/2009 2:34:18 PM)

Site Name: ANACONDA ALUMINUM

GWIC Id: 85183

Section 1: Well Owner(s)

1) ANACONDA ALUMINUM COMPANY (MAIL)

COLUMBIA FALLS MT 59912 [03/15/1954]

Section 2: Location

Township	Range	Section	Quar	ter Sectio	เกร
30N	20W	2	N	N% SW%	
€		Geocode			
FLATHEAD					
Latitude	Longitude		Geomethod	D	atum
48.3911	114,128		UNKNOWN	N	AD27
Ground S	Surface Altitude	3	Method	Datum	Date
	3107				
Addition		Block		Lot	

Section 3: Proposed Use of Water

INDUSTRIAL (1)

Section 4: Type of Work

Drilling Method: PICK & SHOVEL

Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Monday, March 15, 1954

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Туре			
0	109.9	16				STEEL			
Pama	Panalatian (BartiCornan)								

Completion (Perf/Screen)

			# of	Size of	
From	To	Diameter	Openings	Openings	Description
106	119	16			JOHNSTON 16IN SC

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 135 Static Water Level: 90 Water Temperature:

Pump Test *

Depth pump set for test __ feet.

242 gpm pump rate with _ feet of drawdown after 118 hours of

pumping.

Time of recovery hours.

Recovery water level feet.

Pumping water level 107 feet.

* During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.

Section 8: Remarks

Section 9: Well Log Geologic Source

112ALVM - ALLUVIUM (PLEISTOCENE)

From	To	Description
0	42	GRAVEL ROCK AND CLAY STREAKS
42	45	GRAVEL & CLEAN SAND
45	48	GRAVEL & BOULDERS
48	69	ROCK SAND SOME SANDY CLAY
69	84	COARSE GRAVEL & SAND
84	86	HARD FINE SAND
86	110	COARSE GRAVEL & SAND
110	113	FINE GRAVEL & SAND
113	115	COARSE ROCK & SAND
115	116	CEMENTED ROCK & SAND
116	135	GRAVEL ROCK & SAND

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:

Company: LAYNE-MINNESOTA

License No: WWC-438 Date Completed: 3/15/1954 "Kalisa"!

KOROMETRICS

36N 20N 02 CB

TEST HOLE COS | W7/TW19/13829

Continuent I rais vision Sec. in Transition, and Description's Security of Sea School and February Continuent of Sea School and February Continuent of Security Continuent Conti	Parallel To ANN I ble Son, If Tront Son, St. Estation State Son Section of the substantion near feature secondar By: Ann Butt. [Atta-Sold Street Sold Sold Sold Sold Sold Sold Sold Sold	State: £	on tempe	County: Flathead. Project: Aluminum Flant. Noie Name: 78-39
Recorded By: 10 to Rath Profession Williams Profession Williams Profession Williams Profession and earth Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Profession Professio	Secretic by: No me with State of the control of the	Jugat		
Addid for some and point again again to the process of the process	And the rip monary of anticology of the following of the period of the p	8		Sto. 2 Truct 64, 54 Libetibel Combenit of the substation pays famile Sate Sole Date Sole Common Common Common Deliting Wastern Kings
definite for value private Board Air Statement of State Private of Statement Air value and Statement Air value and Statement S	Joseph Land Land Land Land Land Land Land Land	ļ	Byt John Xu	
Description	Secretary Contings 6" steel this sail disperse for for for for for the state of the	ete tibovi t		
Page 1 per and Acceptable of the period of t	Property 1st when Property Property 1st when Property Property 1st when Property Property 1st when Property Property Property 1st when Property	Ş,		
Well Developed? X	Visit Day Not an Antibus Performance of Armaneed Communication Day States and Armaneed Visit Day of States and Armaneed Communication Visit Day of States and Armaneed Visit Day of Visit Day o	Weight :: Sage of t	saing: 6° s	
Set Task Pusped* X Stated with Nitter Engle Stated with a foorb Set Task Pusped* X Stated with a foorb Set Each Samples Taken? X Society of Pulling Casing Set Each National Samples Taken? X Tac Logging only X Steen (specify) Statewheet perforator E - Logg? X Static Water Level: V2.85* Dute: Cff22/03 Static Water Level: V2.	Set of the second of the set of t	ALPRE:	1st poter	Parker British Control
### Stored with will's Entire Stored with a Four Stored with a Four Samples Taken? X Screened by Pulling Casing She E.f ####################################	State of visit first finders? X State of visit filting finish Share of the filters of Shapeling Takens? X for largeing daty X Other (apacing) States are forested. 2 Larges 2 Table of Shapeling Takens? X for largeing daty X Other (apacing) States have perforation. 2 Larges 2 Table of Largeing Share of the states of the		s 20 m a 20	
Screened by Pulling Cosing Saw C.P **Reches, Samples Taken? X for Lapping only X other (specify) Stockheek perforator 5 - Legs? Static value Level: 90 35' Super CATABATS **Resulting Poing Septimential Control of Steel casing Sile 22' Pull Acquive Completion Description: Top of steel casing Sile 22' Pull Acquive Completion Description: Steel casing to 113'. Bentance placed encode outside of casing. Remarks: Critic 3-3/4" have be 90' for reservoir for aciding centerise. Orive 5' saving and drift out inside of casing of 0; we basing to 1'3'. Perforate attest basing and relevance Conditions and Spreling From Fo Datteling to 2'3'. Perforate attest basing and relevance Conditions and Spreling From Fo Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions and Spreling **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions. **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions. **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions. **Fig. To Datteling to 1'3'. Perforate attest basing and relevance Conditions. **Fig. T	######################################	£		X Stotood vish mill's Marke (Storred wish a foorb
Static Major Level: %2.25' Subject CATALLYS Static Major Level: %	distories. Samples Taken? x for Eaging only X Other Especify? Standard perforation x Loss? x			X Screened by Fulling Casing Saw E.t
Static Wolch Level: 92.85" Date: CMTRRPS Seasoning Point Seasoning Point Description Point Seasoning Steel casing as 113". Reptants placed around outside of spaing. Semantic Point ArXIV: hole to 30" for receiving for adding centendre. Drive 6" sating and drift our incide of casing. Cost of Drive Louisa to 13". Pendorate steel passing and revetop by air sarying. From To Dittling to 0 Scotograf, Englishing, Masser Conditions and Secuting SAMD - Brown, Fine to rearra grained, promise cented, subsequites to subsequites. Drive Louisand Secuting SAMD - Brown, Fine to rearra grained, promise cented, subsequites to subsequites. Drive Louisand Secuting SAMD - Brown, Fine to rearra grained, promise cented, subsequites to subsequites, unconsolitated, trace cusy, crose fine ground, maist. Drive Louisand Secuting SAMD AND GRAVEL - Samd as above, SEN gravet, red, group, black 124 to 2" subsequites of segment and secutions. SAMD AND BRAVEL - Samd as above, SEN gravet, red, group, black 124 to 2" subsequites to subsequites dispers in part, they reduct, gravet green, red, store,	Static waves levels 193.251 Dute: OffSEATS ###################################		Samples Take	#? X Yor legging only — X Other (specify) Starwheal derforator
#### Above (9%-) ####################################	Security Point Security Top of steel decing Side 32' Set Bellow Security Security Security Security Top of steel decing Side 32' Set Bellow Security			
Dell Acon, is Completed Percer Price: Steel dasing to 1131. Bentamite placed around outside of dasing. Remarker Pril 3-3/4° hole to 101 for reselvoir for adding centerine. Prive 6° saving and drift our incide of carrier on the carrier of carrier of carrier of the carrier of carrier of the carrier of carrier of the car	Part Complete Season (12): Steel dasing to 113'. Rentomite placed proposed quantity of paring. Reservit Did 3-374' hote to 30' for reservain for occing tentomite. Only 4' occurs and doubt our works of cast of 3' we having to 1'3'. Performing and rentoming and receipting and occurs of cast of 3' we having to 1'3'. Performing tentoming and receipting after our purples. Prop To DAGLING 498 Sectioning, Destiting, Name Conditions and Sometring 3 3420 Brown, that to represent the parity norther, unboughter to subrounded, unconsolidated, trace ours, shape the property rosts. 3 'O SAND AND GRAVEL Seasons above, NEW growet, red, ground, policy, black 224 to 3' elemented (10) curvated distribution, gravel to requested of englishing and quantities. 30 SAND AND SAND GRAVEL Seasons above, they sitty, dry, proved 174 to 1'. 31 SAND AND SAND SANDEL Sand de above, they sitty, dry, proved 174 to 1'. 32 SAND AND SAND SANDEL Sand bover, they are copies and made graves growed, subergular to transported of the sand sand sand sand sand sand sand sand			
Dell Acon, is Completed Percer Price: Steel dasing to 1131. Bentamite placed around outside of dasing. Remarker Pril 3-3/4° hole to 101 for reselvoir for adding centerine. Prive 6° saving and drift our incide of carrier on the carrier of carrier of carrier of the carrier of carrier of the carrier of carrier of the car	Part Complete Season (12): Steel dasing to 113'. Rentomite placed proposed quantity of paring. Reservit Did 3-374' hote to 30' for reservain for occing tentomite. Only 4' occurs and doubt our works of cast of 3' we having to 1'3'. Performing and rentoming and receipting and occurs of cast of 3' we having to 1'3'. Performing tentoming and receipting after our purples. Prop To DAGLING 498 Sectioning, Destiting, Name Conditions and Sometring 3 3420 Brown, that to represent the parity norther, unboughter to subrounded, unconsolidated, trace ours, shape the property rosts. 3 'O SAND AND GRAVEL Seasons above, NEW growet, red, ground, policy, black 224 to 3' elemented (10) curvated distribution, gravel to requested of englishing and quantities. 30 SAND AND SAND GRAVEL Seasons above, they sitty, dry, proved 174 to 1'. 31 SAND AND SAND SANDEL Sand de above, they sitty, dry, proved 174 to 1'. 32 SAND AND SAND SANDEL Sand bover, they are copies and made graves growed, subergular to transported of the sand sand sand sand sand sand sand sand	isaserino Sescriptio	Point XI-llevation	: Top of steel cabing Til8.72' of Be(Sw 9.31) +2.0
Remarks: Drill 8-3/4" hole to 10° for restable for adding centeries. Drive 6° sesting and drill our inside of casting. From Re DRILLING LOG Geological, Brilling, Mater Conditions and Serving. SAMO - Brown, Pine to roanse grained, poorly contest, added to submounded, unconsolidated, trace duty, trace fine grains, noist. > 10 SAMO AND GRAVEL - Sand as above, SMM gravel, red, grade, gray, black 174 to 3° submounded, and submounded, gravel is compassed of engilities and quartizity. 10 20 SAMO AND READER SANDEL - Sand, brown, fine - sparse grained, siley, according submounded, supergular to telecomoded, unconsolidated slavey in part, two police, gravel greek, red, clark.	Prom To DATELING COS Sectoring and reverse to the Sectoring and direction of costing and direction of costing to 1'3'. Perforage sheet packing and reverse by an imaging. From To DATELING COS Sectoring, Smilting, Waser Conditions and Sections G S SAND Shown, Pine to command grained, poorly contact, debugging and described unconsidered and sections G S SAND Shown, Pine to command grained, poorly contact, debugging and sections G SAND HAB GENARD. Sand do above, SEE gravel, red, grades, gray, black 174 to 2's subscinded, unconsolidated, trace class, seek gravel, red, grades, gray, black 174 to 2's subscinded, unconsolidated, gravel in compassed of angle size and quadrizate. 10 20 SAND AND NEWEL - Sand do above, they after a command 174 to 1'. 21 SAND AND NEWEL - Sand, brown, fine a command and large, coorly sorted, subscinded, subscinded, unconsolidated sizers in part, they make, prevent green, red, star, cultivated of 25 to 1 122° thanks, prevently a lattice provided water in this chaper sorte. 22 SAND AND CENARD. As above, stignity what 23 SAND AND CENARD. As above, stignity what 24 SAND - Ergon, Plan-grained, 35% modern grained, chilty, traci class, well content, incrementally, and command and provided graves design and 44 - 170° to saze, pay. 24 SAND Croy benear, time to menture and any strend, early shifty, podernately santed, 104 corpse			
From To DRILLING LOG Scotogical, Emilting, Namer Conditions and Sections From To DRILLING LOG Scotogical, Emilting, Namer Conditions and Sections SAME - Brown, Fine to commander provided, poorly content, pobloogister to submicious, Lasconsolidated, trace dumy, trace fine grount, noist, 10 SAME STAYEL - Sand as above, RDL gravel, red, group, pray, black 1/4 to 2' submiciously, Lanconsolidated, gravel is composed of engineers and quadrate. 10 PO SAME AND NERVEL - Sand, brown, fine - coarse grained, siley, poorly sented, subargular to tobrounded, ascomptiblished player in part, tray solet, gravel gravel, red, clark.	From the DattLike tod Sentegrant, Britting, Mater Conditions and Singling 5 SAMD - Brown, From the noises granted, pourly sorted, subsequent to subrecrees, unconsolidated, trace cury, chart fire provet, folist. 5 10 NAMD AND DIAVEL - Sand do chows, SEN growed, sent grants and grants to subrecrees, unconsolidated, trace cury, chart fire provet, folist. 5 10 NAMD AND DIAVEL - Sand do chows, SEN growed, sent grants and grants to subrecrees, unrounced identify graved in composed of segiciate and quantities. 10 20 SAND AND NEXTER - Sond do chows, sent patter, dry, proved 174 to 3 20 The SAND AND NEXTER - Sond, brown, fine a contact grained, dilay, aboutly sorted, subrequiter to subrecreed, unconsolidated blayes in gart, draw makes gravel grained, first provides water in this playes before. 21 SAND AND CERVE. As about, slightly valed. 22 SAND AND CERVE. As about, slightly valed. 23 SAND Cerve in the grained, diffusioned graves, gravel classes are 174 to 175° in size, sry. 24 SAND Cerve beautiful to scalar sensions, very silty, examinate action, well conted, increased library, increased graves, gravel classes are 174 to 175° in size, sry. 24 SAND Cerve beautiful to scalar sensions, very silty, examinately sorted, the size, sry.			
From To DRILLING COG Geological, Emilting, Mater Conditions and Sending D S SAMD - Brown, Pine to modern granned, poprly apriled, subsengition to subcounded, unconsolidated, trace duby, those fine grannel, holist, b SAMD AND STAYEL - Send as above, SEN gravel, med, grand, black 124 to 21 subrounded, unconsolidated, preval is subpassed of engitelity and quantities. 10 20 SAMB AND NEAVEL - for above, very pility, dry, gravel 1/4 to 11. 20 21 SAMD AND NEAVEL - Send, brown, fine - course grained, silty, moonly someting, subargular to topromoded, unconsolidated playey in part, they make, press, med, plane.	From Te BRILLING COO Georgical, Bestiting, Names Constrains and Specing 3 SAND Brown, Fine to rosman granted, pacify opered, exhoughter to submanades, unconsoladated, trace clay, choose fine greated, exhoughter to submanades, unconsoladated, trace clay, choose fine greated, naist. 5 '0 SAND AND CHAVEL - Kend on above, Mix gravet, red, graces, gray, black 174 to 3 submanades, unconsoladated, gravet is responded of englishered quarterie. 10 20 SAND AND WEAVEL - In Above, wary alley, sty, stated 174 to 1. 20 SAND AND WEAVEL - Sand, brown, fine - operate gralead, siley, accordy sented, submigular to tedenounded, unconsoladated above, in part, they make, gravet green, not, above, underconded to 1 R2" clarks, permitty a little pendied water is this classy according to GAND AND GRAVE. Is above, slightly minet. 24 60 SAND And Sepan, fine-grained, TSV today gravet, disput, today class are 1/4 = 1/5" to size, say PH 40 60 SAND And Roys Brown, like to accounted gravet, dravet classes are 1/4 = 1/5" to size, say	Reserter	0711 3-574	" hole to 30' for resmoir for adding pertanite. Drive 6' testre and drift our inside of
From Po DRELING LOG Geological, Brilling, Waser Conditions and Serving 5 5 SAAD - Brown, fine to rosest graved, poorly corted, edecadate to subscurded, unconsolidated, trace dusy, trace fine great, noist. 5 19 SAAD AND GRAVEL - Sand as above, SAN grevel, sed, grace, gray, black 1/4 to 2 subscurded, unremodificated, gravel is compassed of arginists and quarteria. 10 20 SAND AND NERVEL - As above, very sites, dry, praced 1/4 to 1: 20 PS SAND AND NERVEL - Sand, brown, fine - coarse grained, sites, poorly screed, subscurder to tubicocoded, unconsolidated slaves in part, they make, green, red, place.	Prop To Disting Log Geological, Emiling, Names Conditions and Sampling 5 SAND - Brown, fine to morars granted, poorly domina, subsequence to subscindes, unconsolidated, trace duty, composite project, maist. 5 'O SAND AND GRAVEL - Sand as above, Mix gravel, red, graph, place \$74 to 3 sterounded, unconsolidated, gravel is composed of engineer or in quantitate. 10 'O SAND AND GRAVEL - Sand, brown, fine - operas grained, siley, moonly consed, subarquian to subscended, unconsolidated stayey in part, very mint, gravel green, met, place, uninconded not to 122° clothe, promptly intil product water in this closesy are. 10 SAND AND CRAVEL - An above, slightly mint. 11 SAND AND CRAVEL - An above, slightly mint. 12 SAND AND CRAVEL - An above, slightly mint. 13 SAND AND CRAVEL - An above, slightly mint.			
Uniconsolidated, trace duzy, trace fine groups, holds. 2	20 SAND AND DRAVEL - Kand do phowe, 5th gravet, red, grace, gray, black 174 to 3 startanded, gravet is somewhat and gravet, red grace, gray, black 174 to 3 startanded, gravet is somewhat and gravet 174 to 1. 20 SAND AND BRAVEL - Sand, broat, they after, dry, gravet 174 to 1. 20 SAND AND BRAVEL - Sand, broat, fine - course grained, siley, owerly sented, supergular to tobrounded, uncompatible others, in part, they relet, gravet gravet, red, class, supergular to subscounded, uncompatible others, somewhat y a little percent water in this single some. 20 SAND AND CRAYE. As about, slightly mint. 21 SAND AND CRAYE. As about, slightly mint. 22 SAND AND CRAYE. As about, slightly mint. 23 SAND AND CRAYE. As about, slightly mint.			
2 19 SAME AND NEAVEL - Send as above, SEX grovel, and, grobe, gray, black 1/4 to 2 subrelated, 10 20 SAME AND NEAVEL - As above, they siley, dry, gravel 1/4 to 1. 27 35 SAME AND NEAVEL - Send, brown, the - sparse grained, siley, according subergular to 18 subcounded, uncorrectionist slavey in part, they solet, graves green, red, clar.	20 10 SAND AND GRAVEL - Sens as chove, SUD gravel, and, grave, black 124 to 3 submitted. Becaused Additional gravel in composed of englisher and quadrate. 20 23 SAND AND REAVEL - Send, brown, fine - coarse graines, sitely, according someties, supergular to tederogradid, undersolableted player in part, they models, gravel green, red, clark, addressed 775 to 1 122 clarks, populary a little product water is title single, pare. 20 SAND AND CRAVE. As about, iligably model. 21 SAND AND CRAVE, As about, iligably model. 22 SAND AND CRAVE, As about, iligably model. 23 SAND AND CRAVE, As about, iligably model. 24 SAND Cray brown, fine-grained, 35% today graves, clasts are 374 - 175° in saze, day. 25 SAND Cray brown, time to explain praired, very silty, excludes a red 74 - 175° in saze, day.	0	>	SAMO - Brown, Fine to rearst grassed, poprly conted, subengifer to subrechtes,
Bergmanidated, gravel to negrosed of enginesta and quarkness. 10 70 SANE AND NEAVEL - So above, very piley, dry, pravel 174 to 3 20 75 SANE AND NEAVEL - Send, brown, fine - usance grained, citery, boorly conted, subargular to sobrounded, unconsolidated clayry in part, very maket, prevent green, red, clark.	Becommodificated, graved to sumposed of arginists and quotivate. 20 29 SAME AND REAVEL - As above, very siley, dry, praced 176 to 1. 27 25 SAME AND REAVEL - Send, brown, fine - coarse grained, siley, poorly sented, supergular to subcounded not to 1 172% elants, poundably a little product water in this clavey page. 20 30 SAME AND CHAPTER. As above, slightly noted. 20 40 SAME AND CHAPTER. As above, slightly noted. 21 SAME AND AND CHAPTER. As above, slightly noted. 22 SAME AND AND CHAPTER. As above, slightly noted. 23 SAME AND AND CHAPTER. As above, slightly noted. 24 SAME AND AND CHAPTER. As above, slightly noted.			unconsolidated, trace cury, thace fine groups, maist.
Berymostidated, gravel to semposed of enginetic and quarkness. 10 70 SANE AND REAVEL - An above, very oftey, dry, pravel 176 to 1. 20 75 SANE AND REAVEL - Send, brown, fine - opening grained, oftey, boorly sorted, supergutar to sobrounded, unconsolidated stowny in part, very mobil, gravet green, red, story.	Becommodificated, graved to economic proceed of arginists and quarticity. 29 SAME AND REAVEL - As above, very siley, dry, praced 1/4 to 1 29 PS SAME AND REAVEL - Send, brown, fine - operate grained, siley, poorly somed, supergular to subcounded, uncompositivities slayey in part, they which, preced green, rest, start, calculated of 1/5 to 1 1/2° clumbs, possibly a little pending water is this closey pare. 20 SAME AND AND CRAVE. As above, slightly roles. 20 SAME AND AND CRAVE. As above, slightly roles. 21 SAME AND AND CRAVE. As above, slightly roles. 22 SAME AND AND CRAVE. As above, slightly roles. 23 SAME AND AND CRAVE. As above, slightly roles. 24 SAME AND AND CRAVE. As above, slightly roles.			
30 ZO SANE AND NEAVEL - As above, very sitey, dry, gracel 174 to 1. 20 25 SANE AND NEAVEL - Send, brown, fine - coarse grained, sitey, according supergular to sobrounded, unconsolidated slayny in part, very malet, greek, red, stark.	20 PS SAND AND NEAVEL - An above, very biley, dry, graded 1/4 to 3. 20 PS SAND AND DEAVEL - Send, brown, fine - coarse grained, siley, overly socied, subargular to subcounded, unconsolidated bioxey in part, cony rolet, green, red, stark, orderedged 6/8 to 1 1/2" violate, precedity a little perchapt water in this clayer park. 20 SAND AND DEBANE. La above, stigntly rolet. 21 SAND - Erown, flar-grained, 15% sodium grained, silty, transiciary, well conted, interescolidated, 10% eros. Expressionated graves, graves clasts are 1/4 - 1/2" in saze, bry. 22 SAND Copy broke, time to menior proceed, very silty, exteriorely socied, 10% coarse.	, , ,	19	SAND AND STAVEL - Sand is obove. ANN groves, sed, grope, gray, black 1/4 to 2 elbrounses,
70 PS SANG AME SHAVEL - Shed, brown, fine - charge grained, billing, bookly seried, subergutar to sobrounded, unconsolidated blowny in part, they solid, gravet greek, had, blaze,	25 25 SANG ABB DEAVEL - Send, brown, fine - operate grained, siley, according socied, superquier to tedecommend, unconstituted playey in part, termy solich, gracest green, red, stack, sakurounded 1/2 to 1 1/2" wherthy, according a limited pendaged water in this clayey some. 25 10 SAND ABB DEAVEL As above, stigntly notes. 26 40 SAND - Brown, fine-grained, 15% nothin grained, dilty, trace clay, well conted, isometerally above, store and gravel, gravel clasts are 1/2 - 1/2" in sole, say DAD 40 SAND Coay brown, time to make makered, very silty, axabriately sorted, 10% coarse			encerofidate), gravet is removed of angitite and quarteria.
70 PS SANG AME SHAVEL - Shed, brown, fine - charge grained, billing, bookly seried, subergutar to sobrounded, unconsolidated blowny in part, they solid, gravet greek, had, blaze,	25 25 SANG ABB DEAVEL - Send, brown, fine - operate grained, siley, according socied, superquier to tedecommend, unconstituted playey in part, termy solich, gracest green, red, stack, sakurounded 1/2 to 1 1/2" wherthy, according a limited pendaged water in this clayey some. 25 10 SAND ABB DEAVEL As above, stigntly notes. 26 40 SAND - Brown, fine-grained, 15% nothin grained, dilty, trace clay, well conted, isometerally above, store and gravel, gravel clasts are 1/2 - 1/2" in sole, say DAD 40 SAND Coay brown, time to make makered, very silty, axabriately sorted, 10% coarse			
tobicounded, uncornolisated player in part, they abilet, green green, red, steer.	colorounded, unconvolidated blowery in part, they maket, green, red, class, colorounded 7/8 to 1 1/2" clasts, scenably a little perceipt water in this clayer acre. 29	30	2/3	SAND AND NEAVEL - is above, very siley, dry, preval 1/4 to 1:
tobicounded, uncornolisated player in part, they abilet, green green, red, steer.	colorounded, unconvolidated blowery in part, they maket, green, red, class, colorounded 7/8 to 1 1/2" clasts, scenably a little perceipt water in this clayer acre. 29			
tobicounded, uncornolisated player in part, they abilet, green green, red, steer.	colorounded, unconvolidated blowery in part, they maket, green, red, class, colorounded 7/8 to 1 1/2" clasts, scenably a little perceipt water in this clayer acre. 29 39 5440 ARC CRAYC. As above, slightly moint. 26 50 5440 - Eroya, Classgrained, 35% nodium grained, siltry, trace clay, well conted, increased blated, 30% crass, spinoshed graves, graves clasts are 1/4 - 1/2" to saze, say P 1 60 5440 Cray brows, time to make granced, very slitry, externately socied, 10% coarse		25	SAMO AMERISAVEL - Send. brown fine - voerce project. city, coorty script. supprestor to
	subsequented 7/5 to 1 1/2° vlands, secondly a little perceiped water in this clayer some. 30			
	20 3440 AMS CEATE. As aborg, slightly roist. 16 40 5440 - Erovo, (The-grained, 35% noblem grained, 4117y, trace clay, well conted, 18 10 10 10 10 10 10 10 10 10 10 10 10 10			
	16 40 SANG - Erowo, fine-gesiped, 15% todrum grainkd, silty, trace clay, well conted, sermence bistemi, 10% snall kubrounded gravel, gravel clasts are 1/4 - 1/5" in stre, sry Pil 40 SANO Cray brown, time to encion stanced, very silty, somewhately sorted, 30% coarse			THE CONTROL OF THE CONTROL CONTROL OF THE CONTROL O
	16 40 SANG - Erowo, fine-gesiped, 15% todrum grainkd, silty, trace clay, well conted, sermence bistemi, 10% snall kubrounded gravel, gravel clasts are 1/4 - 1/5" in stre, sry Pil 40 SANO Cray brown, time to encion stanced, very silty, somewhately sorted, 30% coarse	•••••••••••••••••••••••••••••••••••••••		
LO 1 EG SANG AME CRAYE. As oboxe, slightly robus.	isomercelleisted, NO das. Reproduced gravel, Gravel clasts are 3/4 - 1/5° to sale, day All 60 SAMS Cray brown, time to excite explosed, very slifty, experiencely socied, 10% course	i de de la managana de la casa de		SAND ARE CRAYE. As globe, slightly roles.
	isomercelleisted, NO das. Reproduced gravel, Gravel clasts are 3/4 - 1/5° to sale, day All 60 SAMS Cray brown, time to excite explosed, very slifty, experiencely socied, 10% course	77000		
16 40 54%0 - Erowo, (Dergraiped, 15% modrum grainkd, kilty, traci cksy, well conted,	3) 60 SAS Cray brown, time to englar managed, very sifty, moderately sorted, 100 course	16	40	54%0 - Brown, Clas-grained, 15% hother grained, silty, thace chay, well conted,
pormeroditésted, DX Engl. Kphrojindou gravel, Gravel clasts are 1/4 - 1/5° in some pry				emnoskoj histori, 193 inst. Kebroelidas gravni, bravni olasta sne 174 - 175° in saze, svy
			PH	
40 60 1455 Cray brown, time to moder present, yeary sifty, codeferely sorted, 10% crasses	grassed. 10% small g aski, tarrasmiko, akomenikoted, dry, hit largo combses at 60 ,	23)	60	SASO Cray brove, ties to median pranced, yeary stiffy, expediately sorted, 10% coarse
urusmed, 10% small g avel, Karasamird, unconsolidated, dos, hit lacgo cobbses at 61 .				grassed, 10% swilly Arel, Kushounfed, unconsmillered, day, lift large rebbies at 61 .
	cuttings from coddies ale green and rec englished.			

m:136829

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu Plot this site on a topographic map View scanned well log (8/7/2009 2:34:06 PM)

Site Name: COLUMBIA FALLS ALUMINUM PLANT * TW-19

GWIC ld: 136829

Section 1: Well Owner(s)

1) COLUMBIA FALLS ALUMINUM PLANT (MAIL)

COLUMBIA FALLS MT 59912 [07/22/1993]

Section 2: Location

Township Range Section Quarter Sections 20W NW% SW% 30N County Geocode

FLATHEAD

Latitude Longitude Geomethod Datum NAD83 114.129974 TRS-SEC 48.390622 Ground Surface Altitude Method Datum Date Addition Block Lot

* During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.

Section 3: Proposed Use of Water MONITORING (1)

Section 4: Type of Work Drilling Method: AIR ROTARY

Status: NEW WELL

Section 5: Well Completion Date Date well completed: Thursday, July 22, 1993

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

				Wall	Pressure			
	From	То	Diameter	Thickness	Rating	Joint	Туре	
-	-2	113	6				STEEL	
	24							

Completion (Perf/Screen)

			# of	Size of	
From	To	Diameter	Openings	Openings	Description
100	111	6			STARWHEEL PERFS

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 8: Remarks

Section 7: Well Test Data

Static Water Level: 92.25

Unknown Test Method *

Pumping water level _ feet.

Recovery water level __feet.

Time of recovery hours.

Total Depth: 114

Yield gpm.

Water Temperature:

Section 9: Well Log Geologic Source

112ALVM - ALLUVIUM (PLEISTOCENE)

From	То	Description
0	5	SAND-BROWN FINE TO COARSE GRAINED POORLY SORTED SUBANGULAR TO SUBROUNDED UNCONSOLIDATED TRACE CLAY TRACE FINE GRAVEL MOIST
5	10	SAND AND GRAVEL-SAND AS ABOVE 50% GRAVEL RED GREEN GRAYBLACK 1/4 TO 2' SUBROUNDED UNCONSOLIDATED GRAVEL IS COMPOSED OF ARGILLITE AND QUARTZITE.
10	20	SAND AND GRAVEL-AS ABOVE VERY SILTY DRY GRAVEL 1/4 TO 1'
20	25	SAND AND GRAVEL-SAND BROWN FINE-COARSE GRAINED SILTY POORLY SORTED SUBANGULAR TO SUBROUNDED UNCONSOLIDATED CLAYEY IN PART VERY MOIST GRAVEL GREEN RED BLACK SUBROUNDED 1/4 TO 1-1/2IN CLASTS POSSIBLE A LITTLE PERCHED WATER IN THIS CLAYEY ZONE
25	30	SAND AND GRAVEL AS ABOVE SLIGHTLY MOIST
30	40	SAND-BROWN FINE-GRAINED 15% MEDIUM GRAINED SILTY TRACE CLAY WELL SORTED UNCONSOLIDATED 10% SMALL SUBROUNDED GRAVEL; CLASTS ARE 1/4-1/2IN IN SIZE DRY
40	60	SAND-GRAY BROWN FINE TO MEDIUM GRAINED VERY SILTY MODERATELY SORTED 10% COARSE GRAINED 10% SMALL GRAVEL SUBROUNDED UNCONSOLIDATED DRY HIT LARGE COBBLES AT 60' CUTTINGS FROM COBBLES ARE GREEN AND RED ARGILLITE.
60		SAND-GRAY LIGHT TAN FINE-GRAINED VERY SILTY 109 COARSE SAND AND FINE GRAVEL DRY UNCONSOLIDATED GRAVEL CLASTS ARE 1/4IN .
73	74	CLAY-BROWN STICKY VERY MOIST

2	SAND-GRAY FINE-GRAINED SILTY CLAYEY IN PART 10% COARSE SAND AND SMALL SUBROUNDED GRAVEL AS ABOVE UNCONSOLIDATED MOIST
85	SAND AND GRAVEL-TAN FINE-GRAINED 20% COARSE SAND A AND SMALL SUBROUNDED GRAVEL VERY SILTY UNCONSOLF DATED MOIST
90	SAND-AS ABOVE 10% COARSE SAND AND SMALL. GRAVEL VERY MOIST WATER AT APPROXIMATELY 90°.
	SAND AND GRAVEL-TAN FINE-GRAINED SILTY 15% COARSE SUBANGULAR-SUBROUNDED GRAVEL; CLASTS ARE 1/4-1/2IN IN SIZE UNCONSOLIDATED HOLE IS MAKING WATER
114	SAND & GRAVEL SAND BROWN FINE GRAINED 15% MED TO COARSE GRAINED TRACE SILT CLAY MODERATELY SORTED MED TO COARSE GRAINED MATERIAL IS SUBROUNDED 15% GRAVEL RED GREEN BLACK SUBANGULAR TO SUBROUNDED CLASTS AR 1/4-1IN IN SIZE CLAST COMPOSITION IS
	85 90 100

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:

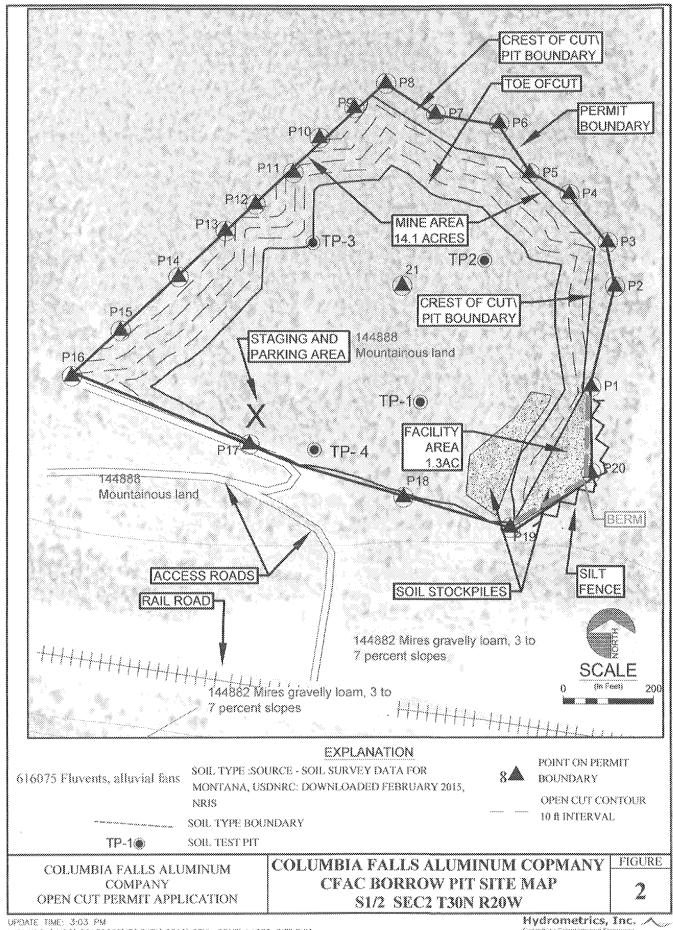
Company: WESTERN WATER WORKS INC

License No: -

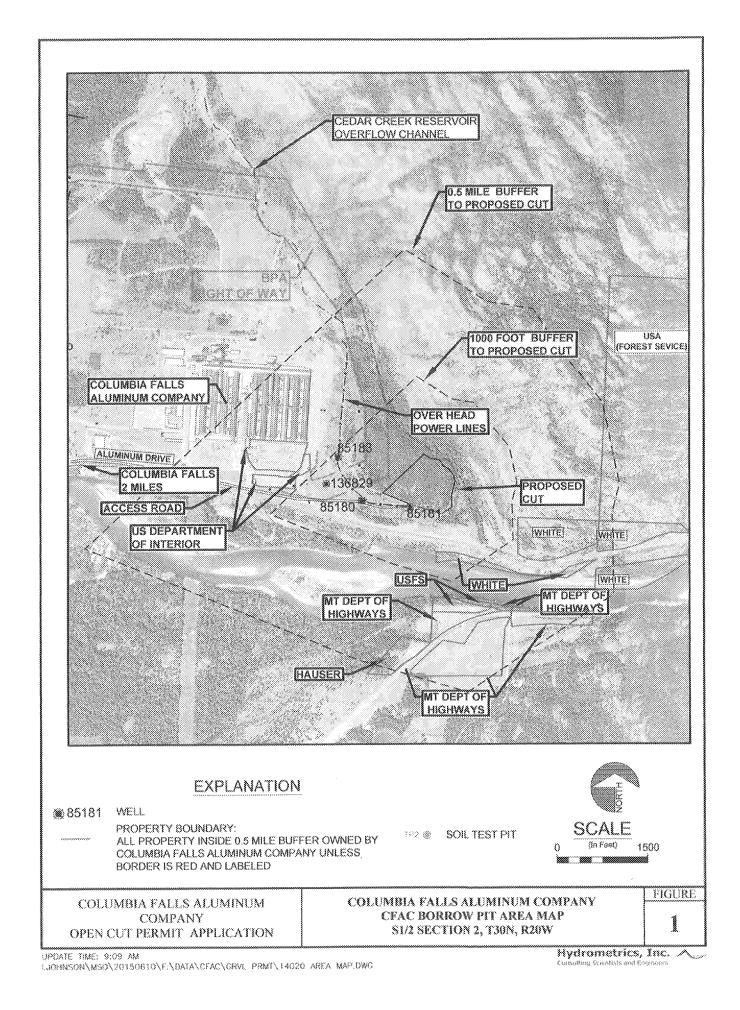
Date Completed: 7/22/1993

20.000	Market A	fAllockia sull
State:		County: Cathead Project: Alember Plant Hole Name: TV-19
fram.		DRILLIPS LOW Geological, Drilling, Water Carpitians and Sampling
<u> </u>	73	2389 - Arsy, light tan, fine-grained, very citty, 102 coarse sand and fine gravel, dry,
		unoonsalidated, grave(plasts are 1/6")
:		
	74	CLAY - Brown, sticky, very coist.
7.2	80	SAME - Gray, time-grained, aftry, clayey is part, 10% spaces sand and small subspaceded
		grave, se above, uncomposituated, motat.
	2400.000	
8.7	80	SAMO AND GRAVEL - Two, fine-grained, 20% coarse wood and small subrounded graves, very
		witty. unconstituted, edist
8>	90	SAME - As above, ICS coarse sand and small gravel, very modil, water at approximately 90%.
\$0	100	SONO ARR CRAYEL - LAR fine crained aller 140
***************************************		\$200 ASD SEAVEL - Tan, fine-grained, sitty, 15% coarse wand and subsequiar - subsequiar
		gravel, grassic clarks are 1/4 - 1/2" in size, precessitioned bala to raking pasar
122	 144	SCNO AND SCROOL PROJECTION STATES
		SAND AND GRAVEL - Soral brown, fine-grained, 13% modium to observe grained, today only play,
		majorately scried, redium to roscae graced majorial is observeded, 192 gravel, and
		groom, blank, subangular to sudrounded, classs are 174 - 1* in time, class composition
		IV DEGILIES and basels.

	TR. 103-110-\$	3.44



LJOHNSON\MSO\20150602\F:\DATA\CFAC\GRVL PRMT\14020 SITE.DWG



PERMIT BOUNDARY COORDINATES TABLE

USED FOR PERMIT, AMENDMENT, REQUEST TO COMMENCE or RELEASE REQUESTS ONLY

- 1) Use this form to submit coordinates to delineate a **Permit** or an **Amended Permit** boundary when submitting a **Permit or Amendment** application, **Request to Commence** form or **Release Request** table.
- 2) When providing coordinates for an **Amended** Permit boundary, you must include coordinates that delineate the *entire* proposed new boundary (i.e. existing permitted boundary plus proposed amendment area).
- 3) When submitting a Release Request, you must use this spreadsheet to provide coordinates of your existing or proposed "new" permit boundary in addition to the Release Request Coordinate table to provide coordinates for the proposed Bond Reduction and/or Acreage Release area(s).
- 4) If you will have **Bonded** and **Non-Bonded** area, complete the **Non-Bonded Boundary Coordinates** table <u>in addition</u> to the *Permit Boundary Coordinates* table (i.e. this form).
- 5) Use this form to delineate Permitted Access Roads. When delineating permitted access roads, place the coordinates after the boundary coordinates and label them as "Access Road" in the "Description" column.
- 6) Coordinates <u>must</u> be in geographic sequence, so that the proposed permit boundary is created by connecting Map ID# P1 to Map ID #P2 to Map ID #P3, etc. The Map ID# for each coordinate must be shown on the site map or a separate BCT map (e.g. P1, P2, P3, etc.). Coordinates must be submitted in **Decimal Degrees** and **WGS 84** datum.
- 7) The "Longitude" column <u>must</u> contain negative numbers. Do not put anything but the coordinate in the Lat or Long boxes (i.e. no "N" or "W", etc.). Coordinates should be in this format Latitude 46.58946 & Longitude -112.00480
- 8) <u>Email</u> the completed Microsoft Excel table to: <u>DEQopencut@mt.gov</u> with "Subject" line: **BCT (Operator-Site Name)**. Do <u>not</u> include a printed version of this table with the paper application submitted to the Helena office.

Operator Name:		COLUMBIA FA	LLS ALUMINUM COMPANY	
	Site Name:	CFAC BORROV	V PIT	
Permit # (if not a new app)		Date:	5/20/2015
MAP ID#	LATITUDE	LONGITUDE	DESCRIPTION (not required)	
Center	48.39117729	-114.1210615	Approximate Center of Site	
P1	48.38973385	-114.12000712	PERMIT BOUNDARY	
P2	48.39030104	-114.11980966	PERMIT BOUNDARY	
Р3	48.39058851	-114.11997566	PERMIT BOUNDARY	
P4	48.39092921	-114.12016364	PERMIT BOUNDARY	
P5	48.39103283	-114.12057203	PERMIT BOUNDARY	
P6	48.39117729	-114.12106154	PERMIT BOUNDARY	
P7	48.39136597	-114.12171439	PERMIT BOUNDARY	
P8	48.39149441	-114.12222564	PERMIT BOUNDARY	
P9	48.39127476	-114.12257553	PERMIT BOUNDARY	
P10	48.39108982	-114.12286019	PERMIT BOUNDARY	
P11	48.39087354	-114.12309190	PERMIT BOUNDARY	
P12	48.39067409	-114.12340537	PERMIT BOUNDARY	
P13	48.39049659	-114.12367062	PERMIT BOUNDARY	
P14	48.39021970	-114.12405840	PERMIT BOUNDARY	
P15	48.38988643	-114.12454576	PERMIT BOUNDARY	
P16	48.38960432	-114.12495725	PERMIT BOUNDARY	
P17	48.38926177	-114.12333348	PERMIT BOUNDARY	
P18	48.38901367	-114.12192531	PERMIT BOUNDARY	
P19	48.38887569	-114.12090665	PERMIT BOUNDARY	
P20	48.38915025	-114.12025422	PERMIT BOUNDARY	
P21	48.39117729	-114.1210615	Approximate Center of Site	
P22				
P23		~		



Flathead County Weed Control District - 309 FFA Orive, Kalispell MT 59901 406.758.5798 fax 406.758.5888 Email: <u>compliance@flathead.mt.qq</u>y

Soil Disturbance - Invasive Plant Management Disturbed Areas, Subdivisions, Industrial Parks, Gravel Pits and/or Utility Installations

Instructions: Complete before disturbance begins and submit to the above address a minimum of two weeks prior to review deadline with Planning Board and/or Commissioners. A copy will be returned to you after it is reviewed in this office.

Subdivision/Project Name <u>CFAC おいでい</u> 。P.+
Physical Location Suckey, Z TBON RZOW
Acres and # of Lots 1 4 O.C.Y. S
Landowner's Name (PLEASE PRINT) CALLED TO FALLS ALLES ALLES CONDUCTS
Mailing Address 2000 Alauniana DV
City, State, Zip Calmabia Falls MT 59912
Phone/Cell <u>404 892 8211</u> Fax <u>406 892 8201</u>
Email Sinrall C. Of Wilson Reserved
Contact Name (PLEASE PRINT) Division Parks
Mailing Address G. G. F. E. B. C. W. W. W.
City, State, Zip U.SSO.La MT STBOL
Phone/Cell <u>특이는 국고도 영고식국</u> Fax <u>식이는 (*) 74-2. 교육</u> 역
Email <u>Aparter e hydrometrics com</u>
Knowledge of the property's terrain, water table and soil type will aid in evaluation of methods needed for weed control. A perfect time for herbicide application is when weeds are young and actively growing but difficult to see. A reference map or drawing of
weed locations is ideal to have on hand.
Indicate noxious weeds present. Spokel Knapweed
marate wasters hierary to be a district to the second of t
Disturbance cause:
Subdivision Road Installation Utility Installation Mining/Gravel Ripping/Scraping Excess Topsoil Stockpile
Other (please describe)
Describe plans to reseed areas where original vegetation has been damaged, disturbed or removed, including phone, gas or
power line burials, or power poles.
She Preparation Soll ye place in ext Vegra divid
Seed Varieties and Rates rafive arass for ffrees as approved by PEQ. Time of Seeding Soring fall
Method of Seeding bund (ast bare wat Stedling)

SD4WMP 2011-0503

Page 11

Biocontrol Insects/Fungi
Graze, Sheep/Goats Mow Hand Pull Annual work to begin Month YEAR TWO Graze, Sheep/Goats Mow Annual work to begin Month Moy Year ZOID Year
Herbicides (list) Mila Secreta Trans Love Control of Secretary Control of Con
Herbicides (list) No la Storia, Translova Cartail 25 laterminal of Option (list) YEAR ONE Annual work to begin Month Moss Year 2010 YEAR TWO Annual work to begin Month Moss Year 2017
YEAR ONE Annual work to begin Month May Year 2010 YEAR TWO Annual work to begin Month May Year 2013
YEAR TWO Annual work to begin Month: May Year Zoil
and the second of the second o
YEAR THREE Annual work to begin Month W pui Year Z O N D
Additional comments:
Other methods of weed management for disturbed area, subdivision, industrial park, gravel pit and/or utility installation:
Contract, conditions, covenants of subdivision sale to include weed treatment
Contractor required to maintain site weed free for a specified period of time
Develop road maintenance plan including weed control
Landscape X Monitor site to ensure new weeds are promptly eradicated
X Reuse or remove excess topsoil
Wash equipment used in infested areas
Assignment of responsibility:
Landowner (until all properties are sold)
Codes, Covenants & Restrictions
Commercial Applicator – Company Name/Contact/Phone
Homeowner's Association - Contact/Phone
I hereby agree to the plan as stated.
Landowner's Signature: Stave Work ht Date: 5-1-2013 Env My Calladra Palla Mauritim
ENV My Collabor PALS Almanian
Approved () of Disapproved () Flathead County Weed Board
Comments or amendments to the submitted plan as reviewed by the Flathead County Weed Board:
Signature of Board Representative STAN COVISIVE Date SULL
Agreed: Landowner's SignatureDate

Page [2]

Columbia Falls Aluminum Company CFAC Borrow Pit Weed Management Plan

Columbia Falls Aluminum Company (CFAC) has proposed an open cut gravel operation in Section 2 (T30N R20W). The gravel pit (Figure 1) would encompass about 20 acres along the south flank of Teakettle Mountain within the CFAC industrial property. The area is adjacent to the aluminum plant industrial facilities and is presently forested.

The Flathead County Weed Board web site, lists 27 noxious weed species and an additional five species as special management zone weeds in Flathead County. CFAC is proposing a weed management plan to combat these infestations in the area of the proposed Open Cut permit.

A primary goal of noxious weed management for the gravel pit operations will be to reduce the opportunity to transport weeds on to and off from the site. Areas to be disturbed by mining will have approximately 24 inches of soil salvaged and stockpiled. Once mining is complete in an area, the mined area will be regraded to flat to gently sloping topography (no slopes greater than 3:1) and stockpiled soil will be re-spread and revegetated. Re-soiled areas will be seeded with a DEQ approved seed mix in the first appropriate season (spring or fall). If seeding/regeneration is not successful, the area or bare spots will be reseeded as necessary.

			Drill	Broadcast	
Common Name	Scientific Name	Variety	(PLS Pou	nds per Acre)	
Western wheatgrass	Agropyron smithii	Rosana	2	4	
Bluebunch wheatgrass	Agropyron spicatum	Goldar	2	4	
Rough bentgrass	Agrostis scabra	****	0.1	0.2	
Meadow brome	Bromus biebersteinii	MacBeth	3	6	
Mountain brome	Bromus marginatus	Garnet	3	6	
Tufted hairgrass	Deschampsia caespitosa	Nortran	0.25	0.5	
Canada wildrye	Elymus canadensis	2	4		
			12.35	24.7	
Cover Crop				***************************************	
Perennial ryegrass	Lolium perenne	Tonga	1	2	
Cereal rye	Secale cereale		10	20	
			11	22	
Totals			23.35	46.70	

CFAC will work with the Flathead County Weed Board to determine what types of controls will be used and the timing of control measures. To optimize the effectiveness of the weed control, CFAC will coordinate their weed control activities with those being carried out by Flathead County and any nearby control groups. The feasibility of using biological controls will continue to be reviewed. Mechanical and cultural control efforts, by themselves, generally, have not proven effective at containing or reducing widespread noxious weed infestations. Roadside mowing, generally, does not prevent knapweed from flowering and going to seed so mowing may not be a viable option. Herbicide application has proven to be the most effective control method for the weeds found in the vicinity of the project area.

The Weed Management Plan proposes the use of approved herbicides. By doing this, we can utilize the best approved treatment chemicals currently available to control the current noxious weeds. The types of herbicides to be used and the application rates will be determined by consultation of with the Flathead Weed Board and published data on herbicides. Parking and loading areas at the gravel operations will be kept noxious weed free to reduce potential transport off site.

The State of Montana licenses herbicide applicators. Applicators are required to keep records showing amount of herbicide applied and date of application. The State also is responsible for checking that applicators are adhering to requirements for record keeping, training and storage. CFAC personnel responsible for noxious weed treatment will assure that any contractors are licensed.

CFAC would require that all applicators adhere to safe application methods and practices, thus reducing the health risk to applicators and on site visitors, and protect sensitive vegetation and waterways. Applicators are required to follow requirements for storage, mixing, use, and disposal of herbicides that are listed on the label of every herbicide. The Environmental Protection Agency approves these requirements, and disregarding them is a violation of Federal and State laws.

Any high use areas where herbicides are used will be signed after spraying. Application rates would depend on the site, weed species, and control objectives and would not exceed label restrictions. All weed populations will be subject to a minimum of annual treatment.

Restoration seeding and appropriate fertilization will be conducted on disturbed sites as soon as seasonally appropriate when the disturbed sites are no longer needed for gravel pit activities. Revegetation seed mixes and practices outlined in the CFAC Reclamation Plan will be followed. Though reseeding is done principally to prevent erosion, it helps inhibit invasion of

disturbed sites by noxious weeds. Prompt revegetation will limit weed establishment and spread.

Personnel responsible for the weed control program will be trained to recognize noxious weeds and will be responsible for conducting the noxious weed survey on the project area or seeing that it is completed. Training will include plant identification using both photographic specimen examples and will be coordinated with the Flathead County Weed Board to take advantage of their resources. CFAC will maintain a list of declared noxious weeds in Montana along with descriptions and photographs at the gravel pit site. CFAC will maintain a general map of the locations of known weed infestations within the permit area. For some weeds, such as spotted knapweed which is ubiquitous, mapping will not likely be a useful tool except on newly reclaimed areas.

Permit area disturbances will be monitored to spot any new infestations. If any new weed species are discovered, the Flathead County Weed Board will be notified. CFAC will maintain a file documenting location and extent of weed infestations at the mine site. New infestations will be controlled at the first appropriate period following consultation the Weed Board.

Herbicide treatment areas will be documented and mapped annually. CFAC will record the locations of the weed treatments used for specific sites and information on any new sites. These records will be maintained at the evaluation adit site office and a summary report documenting new occurrences, treatment areas, plans for the next year's activities and other pertinent information will be submitted to agencies annually. Effectiveness of the various weed control measures will be evaluated and revisions made when necessary.

Reclamation Bond Spreadsheet									
INSTRUCTIONS: Enter your d	ata in the sh	iaded boxe	s. See pag	je 3 for detaile	ed instructions.				
Operator	; Columbia F	alls Alumini	um Compan	V					
8	CFAC Bor	***************************************							
Prepared by									
Date	: 6/28/2015								
			***************************************		***************************************				
Total Permitted Acres	***************************************	acres*	Minister a	Comments:					
*Must match the "Total Permitted Acres" in A1-10 of the Opencut M Plan of Operation & Application.			waad			wall and berm will nize double handle			
e mas an experiences to a populations.						Initial timber remo			
BONDED ACREAGE BREA	KDOWN					lly to minimize dist			
Must match the "Bonded Acres" in sec	Aining			stockpile on easter					
Plan of Operation & Application.		\$				inal permit area ali			
Mine Area Facility Area		acres acres		\$	for banding purpa	ill remain undisturt ses	ин, оди въ изволис		
Access Road		acres							
Bend Reduction Area	\$	acres							
Total Bonded Area :	= 15.4	acres**							
				of the identical to the	Bond submitted by th	e Operator to the Depar	lment.		
Highwall reduction, backfilling,				enn & Annalthaecan					
Lineal Feet & Height must match section of the Highwall cut/fill (describe)	on us-a or ups linear feet			ion & Application Se ratio	cubic yards				
Cut wall	2 130	height 50		13	73,958	Total 1			
			<u>-</u>	d	0	73,958			
Highwall Backfill (e.g. to reclaim hi	ighwalls that v	will not or ca	nnot be cut	and filled during) mining, etc.)	**************************************			
Description	linear feet	height	sloj	pe ratio	cubic yards	·			
				:1	0	total			
Mine Material Backfill (e.g. bringing	.l	rial to the cit	l. Is for hackfil	it otrì	<u> </u>	<u> </u>			
Description	acres	depth	CC SCAL PACKONIONIO	compaction %	cubic yards				
· · · · · · · · · · · · · · · · · · ·	T				Ű	total			
					0	0			
S. Since a with an and a name of	7.7	الأمم مملد منا	la mana mana	. Baalaaamant		linana on anal	್ಷ ಕ		
Mine soil replacement Facility soil replacement	24	4	2	n Replacement	much match section	Jinches OB total	24 0		
Access road soil replacement		inches soil	1	mandaries automos	nera menta perma	total	<u>V</u>		
	L		1			~~ · · · · · · }			
ITEM	UNIT		AMOUNT	•	f	RATE	TOTAL		
Highwalls and backfill			2 marrows and a second	cu yds		per cubic yard	\$73,956		
Mine area grading				acres		per acre	\$2,820		
Mine area ripping Mine soil and OB replacement	24	inches	£	acres acres		per acre per inch/per acre	\$1,410 \$45,684		
Facility area grading	L	humini	\$ 000000000000000000000000000000000000	acres		per acre	\$130		
Facility area ripping			\$	acres	*	per inch/per acre	\$130		
Facility soil replacement	0	inches	1.3	acres	\$135	per inch/per acre	\$(
Access road area grading			}~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	acres	\$100		\$(
Access road area ripping		linches	£	acres	\$100	per inch/per acre	\$(
Access road soil replacement Seeding or other revegetation	0	Juncies	*************	acres acres	\$135 \$200	per inch/per acre per acre	\$(\$3,08(
Fencing				linear ft	\$1		\$0,000		
Weed control			15.4	acres		per acre	\$1,540		
Partially released acres			0.0	acres	\$300	per acre	\$(
Cost to crush onsite asphalt				cu yds	, ,	per cubic yard	\$0		
Cost to Purchase and Place Impor	rtation of Soll/	1-111		cu yds	\$15	, ,	\$0		
Cost to Bond for Reject Fines			 	cu yds	\$1. [per cubic yard	\$(\$(
			 				\$(
							\$(
Estimated Mobilization cost to mov	, ,	,			\$3,000		\$3,000		
Estimated Administration Costs =	10% of total bo	nd cost or \$5	,000 (whichev	er is greater)	\$13,175		\$13,175		

Rate Per Bonded Acre =

15.4

Total Area Bonded =

\$9,410.88 OTAL BOND =

\$144,928



TP-1
200ft N of boundary point 7
Slope 5-10%
Larch over story, mountain
maple, service berry, ninebark,
oregon grape, pine grass, moss

- 0-1 needle litter
- 1-3 silty loam; numerous fine roots; 20% gravel& cobble (rounded); 10YR2/1 wet
- 3-10 silty, clayey sand; numerous fine and common coarse roots; 50% gravel & cobble (rounded); 10YR 4/4 wet
- 10-26 silty, sandy clay; slightly sticky; few coarse roots; 50% gravel and cobbles; cobbles to 8" subrounded/rounded; 10YR6/6 wet